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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,108	09/09/2003	Gerald H. Negley	5308-311	4336
7590	07/08/2005		EXAMINER	
Mitchell S. Bigel Myers Bigel Sibley & Sajovec, P.A. P.O. Box 37428 Raleigh, NC 27627			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/659,108	Applicant(s) NEGLEY ET AL.	
	Examiner Thao X. Le	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 3-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-7 and 9-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 3-7, 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6480389 to Shie et al. in view of US Pub 2004/0041757 to Yang et al.

Regarding claim 3, Shie discloses a mounting substrate for a semiconductor light emitting device in fig. 1 comprising: a solid aluminum block 10, column 2 line 61, including a cavity (concave portion) in a face thereof that is configured for mounting a semiconductor light emitting device (LED) 20 therein, fig. 1, and a conformal insulating coating 14 comprising aluminum oxide, column 3 line 4, on a surface of the solid

Art Unit: 2814

aluminum block 10, fig. 1, first and second spaced apart conductive traces 15a, column 3 line 22, on the conformal insulating coating 14 that are configured for connection to a LED, fig. 1.

But Shie does not disclose a conformal insulating coating in the cavity.

However, Yang discloses a mounting substrate for a semiconductor LED device in fig. 7 wherein the LED is mounting on the aluminum block (metal plate) 43 [0027] comprising conformal insulating coating comprising insulating aluminum oxide layer 42 [0022] completely surrounds the aluminum block 43, fig. 7. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the conformal aluminum oxide surrounding the aluminum block teaching of Yang in the aluminum block of Shie, because in such structure the aluminum oxide layer would have good heat conductivity and providing good heat dispersion as taught by Yang, see abstract.

Regarding claims 4-5, 16-17 Shie discloses the mounting substrate according to Claim 3 wherein face is a first face and wherein the first and second spaced apart conductive traces 15a extend from the cavity to the first face, around at least one side of the aluminum block 10 and onto a second face of the aluminum block 10 that is opposite the first face, fig. 1-2, wherein the first and second spaced apart 15a on the conformal insulating coating 14 comprise reflective material, column 3 line 8.

Regarding claims 6-7, 19, Shie discloses the mounting substrate wherein the face is a first face

But, Shie does not disclose the mounting substrate wherein the solid metal block includes therein first and second through holes that extend from the first face to a second face of the solid metal block that is opposite the first face, the respective first and second through holes including a respective first and second conductive via therein that extends from the first face to the second face and wherein a respective one of the spaced apart conductive traces is electrically connected to a respective one of the conductive vias, wherein the first and second holes extend from the cavity to the second face.

However, Yang discloses the mounting substrate in fig. 4 comprising a first face (top surface) and wherein the solid aluminum block 43 [0027] includes therein first and second through holes 45 [0023] that extend from the first face to a second face of the solid aluminum block 43 that is opposite the first face, the respective first and second through holes 45 including a respective first and second conductive via 413 [0023] therein that extends from the first face to the second face and wherein a respective one of the spaced apart conductive traces 411 is electrically connected to a respective one of the conductive vias [413] and wherein the first and second through holes 45 extend the first surface to the second face. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the through holes comprising conductive vias of LED packaging teaching of Yang with Shie's device, because it would have provided good the thermal dissipation of the LED modules as taught by Yang, see abstract.

Regarding claims 9, 18, Shie discloses the mounting substrate wherein the face is a first face

But, Shie does not disclose the mounting substrate wherein the solid metal block includes therein first and second through holes that extend from the first face to a second face of the solid metal block that is opposite the first face, the respective first and second through holes including a the conformal insulating coating thereon that comprises aluminum oxide and respective first and second conductive via therein that extends from the first face to the second face and wherein a respective one of the spaced apart conductive traces is electrically connected to a respective one of the conductive vias.

However, Yang discloses the mounting substrate in fig. 4 comprising a first face (top surface) and wherein the solid aluminum block 43 [0027] includes therein first and second through holes 45 [0023] that extend from the first face to a second face of the solid aluminum block 43 that is opposite the first face, the respective first and second through holes 45 including a the conformal insulating coating 42 thereon that comprises aluminum oxide [0022] and a respective first and second conductive via 413 [0023] therein that extends from the first face to the second face and wherein a respective one of the spaced apart conductive traces 411 is electrically connected to a respective one of the conductive vias [413]. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the through holes comprising conductive vias of LED packaging teaching of Yang with Shie's device, because it would have

Art Unit: 2814

provided good the thermal dissipation of the LED modules as taught by Yang, see abstract.

Regarding claims 10, 20, Shie discloses a mounting substrate further comprising third and fourth space apart conductive traces 12/51, column 2 line 66, on the second face of the solid aluminum block, fig. 1.

But Shie does not disclose the traces are connected to a respective one of the conductive vias.

However, However, Yang discloses the mounting substrate in fig. 18 further comprising third and fourth space apart conductive traces 412 on the second face of the solid block a respective one of which is connected to a respective one of the conductive vias 413. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the through holes comprising conductive vias of LED packaging teaching of Yang with Shie's device, because it would have provided good the thermal dissipation of the LED modules as taught by Yang, see abstract.

Regarding claims 11-14, Shie discloses the mounting substrate in combination with a semiconductor light emitting device 20 that is mounted in the cavity and is connected to the first and second spaced apart conductive traces 15a, fig. 1, further in combination with a lens 40, column 3 line 43, that extends across the cavity, in further combination with an encapsulant 30, column 3 line 39, between the semiconductor light emitting device 20 and the lens 40, and further combination with lens retainer (leg

portion of lens 40) on the solid aluminum block 10 that is configured to hold the lens 40 across the cavity, fig. 1.

Regarding claim 15, Shie discloses a light emitting device in fig. 1 comprising: a solid aluminum block 10 including a cavity (concave portion), fig. 1, in a face thereof and a conformal aluminum oxide layer 14 on a surface thereof including on the cavity, fig. 2, first and second spaced apart conductive traces 15a on the conformal aluminum oxide layer 14 in the cavity; a semiconductor light emitting device 20, fig. 1 that is mounted in the cavity and is connected to the first and second spaced apart conductive traces 15a, a lens 40 that extends across the cavity; and an encapsulant 30 between the semiconductor light emitting device 20 and the lens 40.

But Shie does not disclose the conformal aluminum oxide coating in the cavity.

However, Yang discloses a mounting substrate for a semiconductor LED device in fig. 7 wherein the LED is mounting on the aluminum block (metal plate) 43 [0027] comprising conformal insulating coating comprising insulating aluminum oxide layer 42 [0022] completely surrounds the aluminum block 43, fig. 7. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the conformal aluminum oxide surrounding the aluminum block teaching of Yang in the aluminum block of Shie, because in such structure the aluminum oxide layer would have good heat conductivity and providing good heat dispersion as taught by Yang, see abstract.



***Response to Arguments***

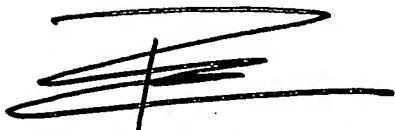
4. Applicant's arguments filed on 26 May 2005 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thao X. Le  
Patent Examiner  
22 Feb. 2004